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ABSTRACT

Some of the aspects of the author/reader relationship that make communication possible are discussed in this paper. The paper begins by describing the most important components of that relationship. Next, through an analysis of two readings of one of Aesop's fables, it illustrates the way the author and the reader must depend on these components. It then focuses on three kinds of knowledge that the author and reader must use for successful communication to take place: conceptual knowledge, social knowledge, and story knowledge. Finally, it discusses implications of this work for reading education. (FL)

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BACKGROUND KNOWLEDGE AND READING COMPREHENSION

Marilyn Adams and Bertram Bruce
Bolt Beranek and Newman Inc.

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University of Illinois
at Urbana-Champaign
51 Gerty Drive
Champaign, Illinois 61820

Bolt Beranek and Newman Inc.
50 Moulton Street
Cambridge, Massachusetts 02138

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So very much of what we learn, we learn through language. Certainly most of our formal education is acquired through language. These observations seem almost too common to set in print. Yet, they turn from banal to deeply paradoxical with the realization that we can only learn through language that which we, in some sense, already know. That is, through language, novel concepts can only be communicated in the form of novel combinations of familiar concepts.

As an example, we can directly access the meanings of only the words we already know. New words are interpretable only if they are explained in terms of old words. This can be done either explicitly, by presenting their definitions, or implicitly, by setting them in a context of old words that effectively constrains their meanings. The analogous situation holds for objects, events, and ideas. If familiar, they may be brought to mind by the slightest and most oblique reference. If unfamiliar, however, they can be communicated through language only by comparing and contrasting them with familiar concepts, by decomposing them into familiar concepts and then piecing together the whole, or by setting them in or against a familiar context.

An upshot of these considerations is that it is misleading to speak of language as a means of expressing one's thoughts. Language is, at best, a means of directing others to construct

similar thoughts from their own prior knowledge. The purpose of this paper is to discuss some of the aspects of the author/reader relationship that make communication possible under these conditions. We begin by describing what we believe to be the most important components of this relationship. Then, through the analysis of two readings of one of Aesop's fables, we illustrate the way the author and the reader must depend on these components. We focus on three kinds of knowledge that the author and the reader must use in order for successful communication to take place: conceptual knowledge, social knowledge, and story knowledge. Finally, we discuss implications of this work for reading education.

The Author-Reader Relationship

The initial responsibility for a text's comprehensibility belongs to the author, as it is the author who composes it. The author's first task is that of deciding what she or he wishes to communicate. The second and more difficult task is that of determining how to communicate it. (Of course, these tasks are not easily separated in practice.) The task of constructing an effective linguistic message consists in (a) correctly guessing what sorts of related knowledge the intended readers already have, (b) producing expressions that will evoke appropriate

subsets of that knowledge, and (c) presenting those expressions in a way that will induce the readers to interrelate the evoked knowledge into a structure that most nearly captures the meaning intended.

With the task broken down in this way, it is clear that a major determinant of a text's comprehensibility is the goodness of the match between the knowledge the author has presumed of the reader and that actually possessed by the reader. This requirement is not unique to written text; it applies equally to all forms of linguistic communication. However, it is especially difficult to fulfill with formal written text. For example, in the typical conversational exchange, the speaker and the listener may know each other very well, and in any case, can exploit the fact that they share a spatial and temporal setting. In addition, conversations are interactive and thus provide ample opportunity for misunderstandings to be detected and corrected when they do arise. In contrast, the author and reader of a formal text are typically strangers, removed from each other in space and time (Rubin, in press).

Our analysis of the author's task points out a second condition on comprehensibility: The goodness of the match between the interpretive or inferential tendencies presumed of and possessed by the reader. As we shall see, an author may

explicitly present very little of the information that is critical to the story; much, and even most, may be left for the reader to infer. At the same time, not everything that is presented in the text requires elaboration by the reader. Moreover, any given piece of information could lead to an infinite variety and range of inferences. The reader is not to generate all possible inferences; to do so would be to lose the author's message entirely. Rather, the reader must have some system for deciding when and what she or he is to infer. We argue that this system is based on the concept of good structure. This concept governs what the author may omit from the text and what the reader must add. For written text to be an effective means of communication, both the author and the reader must have a sound grip on this concept and trust that the other does as well.

These points can be illustrated by considering what is involved in comprehension of the following fable.

The Rabbits and the Frogs

> A group of rabbits was very unhappy because it had so many enemies. So they decided to end their troubles by killing themselves. To do this, they went to a lake nearby to jump in and drown.
>
> There were a number of frogs on the edge of the lake, and they were so frightened by the rabbits that they all jumped into the lake. Seeing this, one of the rabbits said, "Life is not so hopeless after all since these frogs are even more unhappy than we are." So the rabbits all went back to their homes. -- Aesop

Adults who have read this fable for us have uniformly come up with some version of the following interpretation: the rabbits believed that the frogs had drowned themselves; the sight of creatures so pathetic as to feel threatened even by rabbits made the rabbits re-evaluate their own lot in life; with this new perspective, the rabbits abandoned their own plans of suicide and returned to the forest to live stoically ever after; comfort is a question of perspective.

It came as a surprise, then, to discover that other interpretations were not only possible, but were quite defensible. A six year old girl, Elizabeth, gave this account when interviewed about the fable:

Interviewer: Why did the rabbits go back home?

Elizabeth: Because they thought the frogs were trying to kill themselves.

Interviewer: And why did that make them go back home?

Elizabeth: Because then they wouldn't have any more enemies and they could live in peace. But really, they [the frogs] <u>weren't</u> going to die. Right?

Elizabeth showed by these and other comments that she thought that the frogs were the enemies who had worried the rabbits and that the rabbits believed that the frogs had drowned themselves. This meant that the source of the rabbits unhappiness ["...so many enemies"] had been removed. The rabbits abandoned their suicide plans and returned to what they mistakenly believed was an improved life situation.

What is happening here? Did Elizabeth simply miss the point of the story and fabricate her own without adequate basis? We would argue, to the contrary, that in view of the information presented by the author, Elizabeth's interpretation is as rich and well founded as that of the adults. To defend this argument, let us examine some of the types of knowledge that the reader must bring to bear on the story. Each of these types of knowledge must be considered as a potential culprit in the production of the conflicting interpretations. In order to expose the real culprit, we need to examine in detail the story and the two interpretations. Our analysis suggests that the difference between the two interpretations is a difference in the knowledge of or the application of a single facet of the background information presumed by the author.

Conceptual Knowledge

Because even novel concepts and events can only be communicated through terms that are already familiar to a reader, an author must inevitably make certain presumptions about what the reader already knows. In particular, the author must presume that the reader has sufficient knowledge that the words from which the text is built will evoke the concepts necessary for building the story. To the extent that any concept can be made comprehensible to anyone by providing enough information in a clear and simple manner, the author's problem is essentially one of finding the right words for the projected readers. However, the problem is only partly one of vocabulary, at least in the strict sense of that term. Even a word that is well within the reader's vocabulary may fail to elicit the meaning intended by the author. As described below, such breakdowns are liable to arise whenever the author has made erroneous assumptions about either the intensional or the extensional elaborations the reader will make of the concepts named. These three types of mismatches in the conceptual knowledge presumed of and possessed by the reader may be best understood by way of example.

Vocabulary

First, consider a straightforward vocabulary problem:

(a) The discovery of a number of fossilized porbeagles in Kansas is intriguing.

Intriguing for whom? Surely none but the unusual reader who happens to know what a porbeagle is. In contrast, the author might capture the imagination of many readers if the description were reworded:

(b) The discovery of a number of fossilized mackerel sharks in Kansas is intriguing.

Or, depending on how much the author believes the projected audience knows about sharks, an even better wording might be:

(c) The discovery in Kansas of the fossilized bones of a number of large, ocean-dwelling fish is intriguing.

The comprehension difficulties that may be engendered by the use of esoteric words are obvious. If any idea can be expressed in common words, one wonders why an author would ever risk such an impasse. The answer is that less common words are, in general, more informative than more common ones (Finn, 1977-1978); their meanings are more specific. The rhetorical impact of this difference in information is well illustrated in examples (a), (b), and (c). As our hypothetical author has tried

to find increasingly simple words to communicate what has been discovered in Kansas, she or he has been obliged to use an increasing number of words to do so. At the same time, the author has relinquished a large amount of the meaning carried by the original word, porbeagle. Rather than trying to explain the exact nature of a porbeagle, the author has tried to convey only as much of its meaning as would allow the reader to understand why the discovery was mysterious.

Intensional Meaning

This brings us to the second kind of mismatch that may occur between the conceptual knowledge presumed of and possessed by a reader. The intensional meaning of a word consists of the total set of characteristics or properties associated with that class of objects or events to which the word refers (Copi, 1961). Typically, when an author uses a particular word, she or he is not equally interested in all aspects of its intensional meaning. In the examples above, the author's interest in porbeagles was only in those characteristics that made it unlikely for them to be in Kansas. Similarly, the author was not the least interested in the facts that Kansas produces corn, is enjoying an industrial boom, or even that it is one of the United States; she or he cared only that Kansas is many miles from the nearest present-day ocean.

The relevant aspects of a term's intensional meaning should be clear to the reader from the context (Barclay, Bransford, Franks, McCarrell, & Nitsch, 1974); the relevant aspects are those which can be interrelated with the meanings of the other concepts present, such that the message as a whole coheres (attains good structure). However, this is true only if the reader possesses the relevant aspects of the word's intensional meaning. If not, the stage is set for an especially insidious type of comprehension difficulty.

To see this, let us return to our fable. Both the adults' and Elizabeth's interpretations pivoted on the information that frogs can swim. This information was provided by the author only in the sense that it is part of the intensional meaning of frogs. Imagine a reader who was comfortably familiar with the word "frogs," except that all of his knowledge about frogs had to do with tree frogs. Since the ability to swim would not be an element of this reader's intensional knowledge of frogs, he could not generate the same interpretation of the fable as either Elizabeth or the adults. Moreover, if told that he had misunderstood the fable, he might never locate the source of his misunderstanding. He might never suspect the word "frog" since he believed he understood the relevant aspects of its meaning.

Extensional Meaning

The extensional meaning of a term consists of all the objects or events to which it refers (Copi, 1961). For a given reader, the extensional meaning of the word "frog" would consist of all the frogs she or he had seen or otherwise learned about, be they bullfrogs, tree frogs, fairy tale frogs, or toy frogs. To the extent that these instances differ from one another, the meaning of the word "frog" would depend on which of them is brought to mind (Anderson, Pichert, Goetz, Schallert, Stevens, & Trollip, 1976). This is not a problem for readers whose distribution of experiences with frogs has been fairly typical. The natural tendency is to assume the most typical instance permitted within context (Anderson & McGaw, 1973), and researchers have demonstrated that there is a high degree of concurrence among adult Americans as to what constitutes the most typical instance of various categories (Bower, Black, & Turner, 1979; Rosch, 1973; Smith, 1978). However, a reader who has had limited or atypical experience with a particular concept may well instantiate it inappropriately. Several investigators have demonstrated that such comprehension problems arise where there are differences in the cultural backgrounds of the author and the reader (e.g., Bartlett, 1932; Kintsch & Greene, 1978; Steffensen, Jogdeo, & Anderson, 1978). Our hypothetical reader, who knows

only of tree frogs, is a case in point. Conversely, the fact that none of our adult readers believed the fable to be about tree frogs, though many of them were undoubtedly familiar with tree frogs, illustrates the typicality assumption.

Elizabeth vs. the Adults

There is no indication that any of the words in the fable were beyond Elizabeth's vocabulary. Both Elizabeth and the adults seemed to select the same extensional meaning for "frogs": typical pond frogs. Similarly, both seemed to appreciate the relevant intensional characteristics of "frogs": it is normal for them to be at the edge of a lake, and to jump in, and to swim away when disturbed. Similarly, the extension of "rabbits" seemed, for both, to be the typical storybook rabbits. In terms of intension, storybook rabbits are much like prototypical real rabbits, except that they can talk and plan and tend to be frivolous. Both Elizabeth and the adults seemed to accept all of these qualities. In short, even though subtle differences in conceptual knowledge may result in different understandings of a text, there is no evidence that the difference in the interpretations given by Elizabeth and the adults in this case arose from differences in their knowledge about the concepts presented by the author.

Social Knowledge

Language has traditionally been viewed as a code for packaging and transmitting information from one individual to another. Under this view, the meaning of a linguistic message is fully represented by the words and sentences it comprises. Although this view has led to a rich body of theoretical work on the semantics of natural languages (e.g., Wittgenstein, 1921/1961; Katz, 1966), it has limitations.

In recent years, there has been a shift in our conception of what language is all about. In particular, it is increasingly accepted (see Wittgenstein, 1953; Austin, 1962; Searle, 1969) that language, like most other human activities, is primarily instrumental in nature; its primary function for the speaker or writer is as a tool for producing desired effects on the listener or reader.

This shift in perspective has two important and closely associated ramifications for the study of communication. The first is that the meaning of a linguistic message is only partly represented by its content. Its full meaning depends additionally on the purpose that the speaker or writer had for producing it. The second is that the imputation of intentions to a speaker or writer must be an integral component of the listener's or reader's comprehension process.

The way the meaning of a message is shaped by its producer's beliefs and goals is most obvious in the case of blatant propaganda, sarcasm, or tact. But beliefs and goals are no less critical in cases where their role is less apparent. Suppose someone said to you, "I brought two egg salad sandwiches today." Although the referential meaning of this statement might be straightforward, its full meaning depends on whether the speaker's intention was, for example, to offer one of the sandwiches to you, to decline a luncheon invitation, or to explain why the office smelled bad. Whatever the speaker's goal in producing this statement, she or he would, in some sense, have wasted breath if it were not achieved. Thus the meaning conveyed by the speaker's statement depends not only on her or his beliefs and goals, but further, on your realizing that and correctly inferring what they are. Note that if you attributed the wrong intention to the speaker, the result would be confusion and possibly some embarrassment; if you could intuit no plausible motive for the speaker, your response would more probably be, "So what?"

Because of the integral relationship between intention and meaning, the task of engaging in an ordinary conversation can be seen to require an impressive degree of social sophistication. However, the task of comprehending stories brings with it new

dimensions of social complexities (Bruce & Newman, 1978; Bruce, in press). To interpret the significance of anything a character says or does, one must consider both that character's intentions and the impact of the action or utterance on other characters in the story. The impact of an action or utterance on another character depends, in turn, not only on its actual effect or meaning but, in addition, on how that other character perceives the intentions of its perpetrator and on how both the actual effect and the intended effect, as she or he perceives it, fit with her or his own beliefs and goals. Thus, the reader must understand not just the actual event, but additionally, what its perpetrator believes and is trying to do, what the second character believes and is trying to do, and what the second character believes the perpetrator believes and is trying to do. Moreover, characters in stories, as well as real people, know that the significance of their actions or utterances to another depends on the other's beliefs and goals and on the way the other perceives the intention behind the act. Therefore, to understand what one character is doing when she or he plans an action or utterance with the purpose of exerting a specific effect on another, the reader must additionally understand what the perpetrator believes about what the other character believes about the world and what the perpetrator believes about what the

other character believes or would be willing to believe about the motives underlying the event.

If this sounds impossibly complicated, our only rejoinder is that what we have just described corresponds to the most simple level of social interaction that may underlie a story. For example, either character may genuinely misunderstand the beliefs and intentions of the other, thereby setting the scene for a tragedy or a comedy of errors. Alternatively, a speaker or actor may try to conceal or falsely portray her or his intentions. The other characters in turn may or may not perceive the true motivation for the event; and if they do, they may or may not let on, and they may or may not object; and whether or not they object, they may conceal, reveal, or belie their true feelings. It is in this way, by creating layers upon layers of true beliefs, projected beliefs, and beliefs about beliefs, that an author develops romance, deception, collusion, treachery, and foils. Nor are such social intricacies relegated to the domain of adult literature. The interested reader is referred to Bruce and Newman's (1978) analysis of the social structure underlying the first episode of "Hansel and Gretel."

The reader's appreciation of a story depends critically on the recognition of the social relations among its characters. It is often only in terms of the interacting beliefs, plans, and

goals of the characters, that events and activities of a story can be related to one another. Further, it is by creating and relieving tensions among the beliefs, plans, and goals of the characters that the author produces such rhetorical effects as conflict, suspense, surprise, and happy endings. The catch is that these aspects of the story structure are typically not fully or explicitly described by the text; nor, inasmuch as they correspond to psychological dimensions of the characters, could they be, except in the case of a fully omniscient and trustworthy author (Bruce, Note 1). To be sure, the text will provide clues with respect to the beliefs, plans, and goals of its characters, but their elaboration and their relationship to the event structure and message of the story as a whole must be left largely to inferential processes of the reader.

What factors influence the reader's tendency to infer the underlying social structure of stories? An absolute prerequisite for the reader is that she or he approach the text with firmly established and well articulated models of the social situations on which the narration pivots. As with conceptual knowledge, deficiencies on this dimension may often explain comprehension difficulties for readers who are very young or otherwise culturally different from the author of the story. In other cases, however, comprehension difficulties may arise, not because

of any lack of the appropriate social knowledge, but because of a failure to apply, develop, and draw inferences from that knowledge in the way intended by the author of the story. Beyond directly depending on the reader's empathy, authors use a variety of rhetorical devices to shape the social structure of their stories. Examples include: stereotyped characters--princesses, wicked witches, foxes, owls; peripetia--a sudden or unexpected reversal of a situation; and inconsistencies with real world knowledge. To illustrate better the way in which the social dimensions of a narrative may be communicated, let us return to our fable.

The fable begins with a rather direct statement of the rabbits' initial beliefs, plans, and goals. They feel so threatened by their enemies that they decide to end their lives by drowning themselves. The rabbits' proposed solution provides additional information about the state of their feelings and beliefs: within Western culture, suicide can be contemplated only when one believes that a situation is both intolerable and otherwise inescapable. The rabbits then troop to the lake with the intention of carrying out their plan.

There are some frogs sitting at the edge of the lake. Because they are frightened by the rabbits' approach, they jump in. The account given, combined with the reader's real world

knowledge, should yield a completely ordinary and acceptable explanation for both the frogs' presence at the pond and their response to the rabbits. Yet, it is odd that the rabbits should have reacted so strongly to such mundane behavior on the part of the frogs, and this inconsistency is the reader's only clue that the rabbits misapprehended the frogs' situation. To make social sense of the rabbits' response, the reader is obliged to generate a different hypothesis as to what the rabbits believed that the frogs believed and were trying to do. Within the fable, the only motive given for jumping into lakes is that of drowning and thereby escaping from one's enemies. Since this was the rabbits' own motive, the reader knows it is familiar to them. Further, the imputation of one's own motives to others is a commonplace social occurrence. Finally, both the nature and intensity of the rabbits' reaction can be fit with the notion that they thought the frogs were drowning themselves. In short, it is not only plausible, with respect to our knowledge of social behavior, that the rabbits might come up with such a motive for the frogs, but the assumption that they did so gives the story good social structure -- it coheres with the social information given both before and after the frogs' plunge.

The fable ends as the rabbits abandon their own plans of suicide and return to their homes in the forest. Once again, in

the interest of good structure, the reader is forced to make an inference about the rabbits' beliefs. Plans arise from the need to reduce discrepancies between existing and acceptable states of the world. They thus reflect an underlying tension which, in a well structured story, must somehow be resolved. Either the plan must be carried through or its initiating conditions must be altered. In this case the reader is left with only the latter possibility.

The initiating condition for the rabbits' plan was that they felt intolerably and inescapably plagued by their enemies. In what way can it be inferred that these conditions had changed by the end of the story? The adults focused on the intolerability of the initial situation: the rabbits, having "realized" that they were not nearly as bad off as they could be, found renewed strength to cope. Elizabeth, on the other hand, focused on the inescapable aspect of the rabbits' initial situation. She assumed that the frogs were the enemies in question. (Note that nothing in the text violates this assumption.) From this, it follows that if the rabbits believed the frogs had drowned themselves, they must have believed, in effect, that they had permanently escaped from their enemies.

Elizabeth vs. the Adults

Elizabeth's interpretation of the social events in the fable differed significantly from the adults'. Perhaps this was because the social schema of gaining solace through another's misery was unfamiliar to her. Alternatively, as we shall see in the next section, the difference between Elizabeth's and the adults' interpretations might have been due to differences in the knowledge about stories which they brought to bear on the text.

It is interesting to note that Elizabeth's interpretation, in that it assumed planful behavior on the part of the frogs, was socially more complex than that of the adults. In particular, Elizabeth had to infer that the frogs intended to trick the rabbits with the goal of waging a surprise attack later. Further, for that to be a reasonable plan, she must have inferred that the frogs believed both that the rabbits would think they had drowned themselves and that the rabbits would consequently relax and go home. In contrast, the adults' interpretation requires virtually no inferential elaboration on the frogs' belief structure. Under their interpretation, the information given in the text together with common knowledge about frogs provides sufficient support for the frogs' actions.

Story Knowledge

Knowing characteristics of rabbits and frogs is crucial to one's understanding of our example fable. Furthermore, one needs to know characteristics of rabbits-in-stories and frogs-in-stories, e.g., that they can talk, plan, and have emotions. The reader's acceptance of concepts like talking rabbits was described by Coleridge as the "willing suspension of disbelief." However, the acceptance of the rabbits' human qualities does not involve a suspension of the disbelief that real rabbits can talk, but an invocation of the belief that fantasy rabbits often do. Moreover, what the good readers will imagine in the real rabbits' stead is not an idiosyncratically fantastic rabbit but a definite, well formed, and conventional concept in and of itself.

The willing suspension of disbelief or invocation of fantasy beliefs is a central aspect of the contract that a good story presupposes between the author and the reader. The reader, in collaboration with the author, replaces real-world concepts and events with stylized constructs built upon abstractions of the real-world phenomena that are thematic to the story.

Thus, to understand a story, the reader must not only understand the relevant words, real-world concepts, and social interactions, but must additionally draw on knowledge that

pertains to stories in general. The reader must be familiar with the kinds of story-world conventions that the author employs and be sensitive to the devices by which they are signalled. In this section we discuss three of the most important classes of rhetorical conventions: stereotypes, genre characteristics, and story structure.

Stereotypes

In the section on social knowledge, we argued that the imputation of beliefs and motives to characters in stories is essential to understanding their actions and reactions. However, one can soundly impute beliefs and motives to a person only to the extent that one knows that person. In the case of fictional characters which are inventions of an author, the reader knows only what the author provides. In a long story, an author might devote considerable space to the development of major characters. Yet, for lesser characters and characters in shorter stories, the author generally does not have the rhetorical freedom to present complete descriptions; to do so would be to detract from the story itself.

Stereotypes or "stock" characters are the solution to this problem. Instead of wholly developing a character through the text, the author can communicate the character's essence by

identifying it with a stereotype and then elaborating to whatever extent is appropriate. Aesop exploited this technique to its fullest. He typically used different types of animals as characters, and to each type of animal he systematically attached a specific stereotype: foxes are cunning and self-serving; ants are industrious; rabbits are frivolous; and frogs are a little stupid. The reader who is familiar with Aesop's system need know only the character's species in order to understand its essential qualities.

Different kinds of stories use different kinds of stereotypes. In classical mythology there are jealous gods and heroes with hubris; in Western European fairy tales there are valiant princes, wicked stepmothers, and powerful, but stupid giants. Where stereotypes are less pat, their identification on the reader's behalf may be no less crucial to the meaning of the story. The extent to which authors expect and, in fact, depend on a reader to draw on knowledge of stereotypes to flesh out their characters is evidenced by the causal obliqueness with which they are often signalled. For example, the Brothers Grimm tell us that "Rose-Red would run and jump about the meadows, seeking flowers and catching butterflies" (Grimm, 1945, p. 289). Obviously, what the authors stated about Rose-Red is not all they intended to communicate about her. But the rest is up to

the reader. Communication will break down if the reader generates an incomplete or inappropriate image for the character in reference. An inappropriate image is a particular hazard for the reader whose cultural experiences do not match the author's expectations.

Genre Characteristics

Imagine that you, as a tenth grade English student, are given the assignment to discuss the following poem:

SYSTEMS

Aristotle (seems to me)

to approach Poetry

As a

Biologist

would approach a system of organisms

P

i

c

k

i

n

g

O

u

t

Its genera and species

Formulating the broad laws of literary experience

You might not <u>like</u> the poem, but you would know what is expected of you; you are to view the sequence of words as a poem, not as a newspaper story, a joke, a personal letter, or a science

text. This means that you should invoke a set of expectations about the purpose of the author, and relationships between the form and the content of the text. Some of these expectations apply to other types of texts, but some seem appropriate only for poems.

In your discussion, you might, for instance, point out the parallelism that the poet shows between "poetry" and "a system of organisms," and then elaborate on the way the arrangement of the words on the page emphasizes this parallelism. You might discuss other word arrangement effects as well, for example, the spreading of "Picking Out." You could also mention that "literary" and "experience" can be viewed as "broad" words.

Turning more to the content of the poem, you might note the tension that exists between the abstract, almost mechanistic, concepts such as "systems," "picking out," "genera and species," or "broad laws" and the incongruous personal connotations of "seems to me," "experience," or even "poetry." This would call into question the author's intended meanings: Is he merely describing Aristotle's approach, or is he suggesting its ultimate inadequacy? In short, your strategies for reading the poem depend on your beliefs that it is a poem and that it is to be read as a poem.

In fact, the "poem" above was not originally written as a poem at all. We have recast it as such only to make a point. The passage was actually taken from N. Frye's Anatomy of Criticism (1957/1965). It is part of the introduction to his essays on literary criticism in which he puts forth a program of analysis that can be traced back to Aristotle's Poetics. Reading his sentence in the manner of our unfortunate tenth grader gives it a meaning quite different from the one obtained by reading it as part of an analytical prose work, and, we suspect, from the one intended by the author.

In a similar way, one might present a newspaper story with the content of its dateline incorporated into the text and its short paragraphs combined into longer ones. Such a presentation could make the story seem disorganized and undirected, even for a text that would be viewed as well-written in the newspaper genre (Green, 1979). The problem lies in the reader's expectations about how the information should be organized. The more typical non-fictional account of an event typically begins by summarizing the event at issue and then the events that preceded or led up to it. Where such a text departs from the temporal order, it is usually for the purpose of clarifying causal relationships among a family of events. In contrast, the typical newspaper article is written in a "pyramid" form, which gives successively more

elaborate summaries of events, following neither a temporal nor a causal order. This facilitates the task of the page editor who may have to cut a story at the last minute to fit the available space. It can also be a convenience for the reader, as long as she or he is expecting it. An unexpected pyramid form, however, is likely to cause trouble.

In general, each type of text calls forth a set of expectations and suggests specific strategies to be applied in reading (see Olson, Duffy, & Mack, in press). In our example, the story can be viewed as a fable or as a simple narrative about some rabbits and frogs. The view the reader takes will entail specific assumptions about how an interpretation for the story is to be constructed.

For example, viewing the story as a fable suggests that the reader should look for a moral, and interpret the characters' actions to support that moral (see Adams & Collins, 1979). Viewing it as simple narrative, on the other hand, suggests that general comments such as "life is not so hopeless after all" are ornamental, and that one should simply construct a satisfying explanation for the actions based on one's social knowledge (as outlined in the previous section). Thus Elizabeth, viewing the story as a simple narrative, looks for an interpretation that simultaneously accounts for all the loose ends and captures that

dimension of intrigue or excitement that is expected in a good, basic story. The adults, reading the story as a fable, must ensure that the interpretation they construct for the rabbits' actions will lead to a lesson or moral. For them, it is better to assume that the rabbits acted on the basis of their judgment of the frogs' misery than to assume that they thought their problems were really solved. The attribution of fable-hood to the story, then, becomes a critical factor that leads to an interpretation radically different from the one Elizabeth constructed.

Story Structure

Stories also have structural characteristics (see Propp's, 1958, discussion of Russian folk tales). Some of these reflect conventions of the culture in which the stories were written. Others, as discussed above, pertain only to particular genres or kinds of stories. Most, however, arise from the simple fact that stories relate conflicts and their resolutions, planning, goal-seeking, and so on. A story typically presents a problem or a conflict followed by its resolution. When the resolution is ill-defined, the story tells us so. In other words, a story has a beginning, a middle, and an end. Work on story grammars (Mandler & Johnson, 1977; Rumelhart, 1975; Stein & Glenn, 1979;

and Sutton-Smith, Botvin, & Mahoney, 1976; Thorndyke, 1977) has shown that readers develop and use a concept of good story structure when reading.

We have already discussed many of the constraints that help the reader to discover the meaning of a story: genre characteristics, stereotypes, patterns of social interaction and tension resolution, and semantic coherence. However, the most important constraint, one that supersedes and, indeed, shapes each of the aforementioned is that a story is a story. No description, character, event, or outcome is random. Every detail has been contrived by the author. Knowledge of contrivance is then a powerful heuristic for the reader. It says: When in doubt, assume that the author of the text had a purpose, for example, events that are mentioned are meant to be noticed. More generally, the rule tells the reader to posit a conscious author, who, in turn, has imagined a conscious reader. The author and the reader may then interact in a social relationship easily as complex as that between the characters in a story.

Elizabeth's interpretation of the fable indicates full appreciation of both the basic structure of stories and the contrivance heuristic. Reading that the rabbits abandoned their plan of suicide, she searched for an explanation. She evidently

was not sufficiently familiar with the social schema of "feeling better just because you know of someone who feels worse" or with the nature of fables (or both) to come up with the adults' interpretation. Yet, she evidently was sufficiently familiar with the nature of social schemata and story structure to be biased toward an explanation that would cancel the rabbits' initial motive for suicide and its accompanying tension. She turned to the only "loose" concept in the fable: the rabbits' enemies. Since the enemies were explicitly cited in the setting of our fable, one should, under the contrivance heuristic, expect them to play an important role in the story. But they are never mentioned again. Thus, Elizabeth, in assuming that the frogs and the enemies were one and the same, has constructed an interpretation which not only provides a sound explanation for the rabbits' retreat, but further, results in a story structure that is more refined than the one the author presumably had in mind.

Elizabeth vs. the Adults

Considerations in this section lead us to suspect that Elizabeth's misinterpretation of the fable arose primarily from a failure to appreciate that it was indeed a fable. Had she known that the story was one of Aesop's fables, she would not have been

satisfied with an interpretation that did not entail some lesson of conduct. Further, she probably would not have ascribed that devious quality to the frogs that enabled her own interpretation. We cannot tell whether Elizabeth's failure to interpret our story as a fable resulted from a lack of knowledge of fables and their properties, a failure to recognize the cues that the story was a fable, or simply an inappropriate bias towards a more exciting interpretation--but then that is part of the point of this paper.

Discussion

Our analysis of Elizabeth's reading of the fable uncovers a possible explanation for the differences between her interpretation and the adults'. First, there are two ways of resolving the tension created when the rabbits change their plan, one focused on the intolerableness of their life situation and the other focused on its inescapableness. Adults appeared to choose the former because of their recognition of the characteristics of the genre, i.e., a fable must have a lesson or a moral. This one can easily be interpreted as an account of how an intolerable situation can become tolerable through nothing more than a change in perspective. Elizabeth, on the other hand, chose the latter focus, since she apparently viewed the story as a simple narrative in which finding an escape from a bad situation seemed a tighter, more satisfying ending.

This analysis suggests that problems with story understanding arise not only when the reader lacks certain knowledge but also when the reader has selected the wrong knowledge to apply. Knowing that they can choose from conceptual knowledge, social knowledge, and story knowledge, readers may give too much credence to one fact and too little to another. Is there a general rule that will enable readers to search among the vast network of potentially relevant items of information?

A candidate for such a rule follows from the discussion in the section on story knowledge (though it applies equally well to the understanding of texts other than stories). The social interaction between the author and the reader depends on the knowledge they trust they share, and, regardless of the specifics of the text, a crucial component of that shared knowledge is that the reader is looking for good structures. The good structure heuristic is essential for understanding not only stories, but all texts. Indeed, the good structure heuristic is a central determinant of all of our perceptions of the world (Bateson, 1978; Bransford & McCarrell, 1974; Bregman, 1977; Plato, 1955).

Current research in psychology and artificial intelligence has begun to show some of the characteristics of structural knowledge and its use in comprehension (Adams & Collins, 1979;

Anderson, 1977; Rumelhart & Ortony, 1977; Gentner, Note 2). We can also see the beginnings of a model of the process a person might engage in during comprehension, i.e., during the search for a satisfying account of complex phenomena (Collins, Brown, & Larkin, in press; Cohen & Perrault, 1979; Spiro & Tirre, 1979; Woods, in press). These theories, however, are still far from providing a general and detailed explanation of what we observe in the protocols of children's reading and listening to fables. Future research may well give us more insight into the process of searching for good structures.

Meanwhile, a practical implication of the view presented in this paper is that misunderstandings can often be viewed most productively as clues to a reader's expectations or prior beliefs rather than as a measure of competence alone. For example, we found in work with some non-native born children that they had special difficulties with Amelia Bedelia (e.g., Parish, 1976) stories. These stories depend for their humorous effect upon misinterpretations of idioms, such as, "draw the drapes" or "dust the furniture." The children, who could read other stories reasonably well, missed the jokes because they were less familiar with the idioms, which are more a part of spoken than of written language and more culture-specific. In a similar way, Elizabeth's misunderstanding of the fable reflects specific

assumptions she had made about the text and about the knowledge that was appropriate to apply in understanding it.

A related consequence is that reading comprehension must be placed in a context of experiencing, thinking about, and talking about the world. Moffett (1979) and others have argued that reading and writing are hardly "basic skills" in that they rely on the more fundamental skills of conceptualizing, verbalizing, and perhaps, just pondering. This suggests that the widely approved activities of reading to children, talking about books, and so on, serve more than just a motivational purpose. In an important sense these activities exercise the basic skills needed for comprehension.

Conclusion

To say that background knowledge is often used, or is useful, in comprehending a story is misleading. It suggests that a reader has the option of drawing on background knowledge to enhance the comprehension process, but that she or he might just as well do without such frills -- as if there were a reading process separate from the drawing-on-background-knowledge process.

In fact, reading comprehension involves the construction of ideas out of pre-existing concepts. A more correct statement of

the role of background knowledge would be that comprehension is the use of prior knowledge to create new knowledge. Without prior knowledge, a complex object, such as a text, is not just difficult to interpret; strictly speaking, it is meaningless.

We have seen in the discussion of the "The Rabbits and the Frogs" a hint at the complexities of background knowledge that are needed to understand an apparently simple story, and also the problems that can arise when there is a mismatch between the author's expectations of the reader and the reader's actual knowledge. These problems are not restricted to story understanding. Instead, we might say that the application of background knowledge in "The Rabbits and the Frogs" is merely illustrative of the role prior knowledge plays understanding texts, or for that matter, life, in general.

Reference Notes

1. Bruce, B. A social interaction model of reading. Manuscript submitted for publication, 1980.

2. Gentner, D. Integrating verb meanings into context. Manuscript submitted for publication, 1980.

References

Adams, M.J., & Collins, A. A schema-theoretic view of reading. In R. Freedle (Ed.), New directions in discourse processing. Norwood, N.J.: Ablex, 1979.

Anderson, R.C., & McGaw, B. On the representation of the meanings of general terms. Journal of Experimental Psychology, 1973, 101, 301-306.

Anderson, R.C., Pichert, J.W., Goetz, E.T., Schallert, D.L., Stevens, K.V., & Trollip, S.R. Instantiation of general terms. Journal of Verbal Learning and Verbal Behavior, 1976, 15, 667-679.

Austin, J.L. How to do things with words. London: Oxford University Press, 1962.

Barclay, J.R., Bransford, J.D., Franks, J.J., McCarrell, N.S., & Nitsch, K. Comprehension and semantic flexibility. Journal of Verbal Learning and Verbal Behavior, 1974, 13, 471-481.

Bartlett, F.C. Remembering. Cambridge: Cambridge University Press, 1932.

Bateson, G. Mind and nature: A necessary unity. New York: Dutton, 1978.

Bower, G.H., Black, J.B., & Turner, T.J. Scripts in memory for text. Cognitive Psychology, 1979, 11, 177-220.

Bransford, J.D., & McCarrell, N.S. A sketch of a cognitive approach to comprehension. In W. B. Weimer & D. S. Palermo (Eds.), Cognition and the symbolic processes. Hillsdale, N.J.: Erlbaum, 1974.

Bregman, A.S. Perception and behavior as compositions of ideals. Cognitive Psychology, 1977, 9, 250-292.

Bruce, B.C., Analysis of interacting plans as a guide to the understanding of story structure (Tech. Rep. No. 130). Urbana: University of Illinois, Center for the Study of Reading, June 1979.

Bruce, B.C., & Newman, D. Interacting plans. Cognitive Science, 1978, 2, 195-233.

Cohen, P.R., & Perrault, C.R. Elements of a plan-based theory of speech acts. Cognitive Science, 1979, 3, 177-212.

Collins, A., Brown, J.S., & Larkin, K.M. Inference in text understanding. In R.J. Spiro, B.C. Bruce, & W.F. Brewer (Eds.), Theoretical issues in reading comprehension. Hillsdale, N.J.: Erlbaum, in press.

Copi, I.M. Introduction to logic. New York: Macmillan, 1961.

Finn, P.J. Word frequency, information theory, and cloze performance: A transfer feature theory of processing in reading. Reading Research Quarterly, 1977-1978, 13, 508-537.

Frye, N. Anatomy of criticism. New York: Atheneum, 1965 (Originally published, 1957).

Green, G.M. Organization, goals, and comprehensibility in narratives: Newswriting, a case study (Tech. Rep. No. 132). Urbana: University of Illinois, Center for the Study of Reading, July 1979.

Grimms' fairy tales. (E. V. Lucas, L. Crane, & M. Edwards, Eds. and trans.). New York: Grosset and Dunlap, 1945.

Katz, J. The philosophy of language. New York: Harper and Row, 1966.

Kintsch, W., & Greene, E. The role of culture-specific schematic in the comprehension and recall of stories. Discourse Processes, 1978, 1, 1-13.

Mandler, J.M., & Johnson, N.S. Remembrance of things parsed: Story structure and recall. Cognitive Psychology, 1977, 9, 111-151.

Moffett, J. Commentary: The word and the world. Language Arts, 1979, 56, 115-116.

Olson, G.M., Duffy, S.A., & Mack, R.L. Knowledge of writing conventions in prose comprehension. In W.J. McKeachie & K. Eble (Eds.), New directions in learning and teaching. San Francisco: Jossey-Bass, in press.

Parish, P. Good work, Amelia Bedelia. New York: William Morrow and Company, Inc., 1976.

Plato. [The Republic.] (H.D.P. Lee, Ed. and trans.). Toronto: Penguin Books, 1955.

Propp, V.I. Morphology of the folk-tale. Austin: University of Texas Press, 1958.

Rosch, E. On the internal structure of perceptual & semantic categories. In T. E. Moore (Ed.), Cognitive development and the acquisition of language. New York: Academic Press, 1973.

Rubin, A.D. Comprehension processes in oral and written language. In R. Spiro, B. Bruce, & W. Brewer (Eds.), Theoretical issues in reading comprehension. Hillsdale, N.J.: Erlbaum, in press.

Rumelhart, D.E. Notes on a schema for stories. In D. Bobrow & A. Collins (Eds.), Representation and understanding: Studies in cognitive science. New York: Academic Press, 1975.

Rumelhart, D.E., & Ortony, A. The representation of knowledge in memory. In R.C. Anderson, R.J. Spiro, & W.E. Montague (Eds.), Schooling and the acquisition of knowledge. Hillsdale, N.J.: Erlbaum, 1977.

Searle, J.R. Speech acts: An Essay in the philosophy of language. Cambridge: Cambridge University Press, 1969.

Smith, E.E. Theories of semantic memory. In W. K. Estes (Ed.), Handbook of learning and cognitive processes (Vol. 5). Hillsdale, N.J.: Erlbaum, 1978.

Spiro, R.J., & Tirre, W.C. Individual differences in schema utilization during discourse processing (Tech. Rep. No. 111).

Urbana: University of Illinois, Center for the Study of Reading, January 1979. (ERIC Document Reproduction Service No. ED 166 651)

Steffensen, M.S., Jogdeo, C., & Anderson, R.C. A cross-cultural perspective on reading comprehension (Tech. Rep. No. 97). Urbana: University of Illinois, Center for the Study of Reading, July 1978. (ERIC Document Reproduction Service No. ED 159 660)

Stein, N., & Glenn, C.G. An analysis of story comprehension in elementary school children. In R. Freedle (Ed.), New directions in discourse processing. Norwood, N.J.: Ablex, 1979.

Sutton-Smith, B., Botvin, G., & Mahoney, D. Developmental structures in fantasy narratives. Human Development, 1976, 19, 1-13.

Thorndyke, P.W. Cognitive structures in comprehension and memory of narrative discourse. Cognitive Psychology, 1977, 9, 77-110.

Wittgenstein, L. Philosophical investigations. New York: Macmillan, 1953.

Wittgenstein, L. Tractatus logico-philosophicus. London: Routledge & Kegan Paul, 1961 (Originally published, 1921).

Woods, W.A. Multiple theory formation in high-level perception. In R.J. Spiro, B.C. Bruce, & W.F. Brewer (Eds.), Theoretical issues in reading comprehension. Hillsdale, N.J.: Erlbaum, in press.

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